

Remarks

The Examiner will see that the applicants have amended claims 1, 3, 10, 12 and 16 to 18 and have canceled claims 4, 8 to 9, 14 to 15 and 19 to 21. In so doing, the applicants have addressed the claim rejections under 35 USC §112 identified by the Examiner in paragraph 2 of the Office Action and the claim rejections under 35 USC §101 identified by the Examiner under paragraph 4 of the Office Action.

The Present Invention

Before addressing the prior art references cited by the Examiner, the applicants would like to briefly summarize the problem addressed by the present invention and the solution to it as claimed.

In a shared access medium, such as a passive optical network (PON), all end users will by definition receive downstream data signals whether intended for them or not. In the context of a multicast channel service, if one end user on the shared medium access network subscribes to a multicast channel and is receiving signals for that multicast channel, then by definition all other end users on the shared medium access network will also be receiving those signals, although the other end users may or may not be members of the multicast channel group maintained for that multicast channel. An end user may request to join the multicast channel group address and, if allowed, will be able to receive and use the multicast channel signals since the signals will be addressed to a group including that end user.

The present invention recognizes that in the context of a shared medium access network, end users who are not permitted to access multicast signals (for example because they do not pay for them) must additionally be prevented from joining the multicast channel. However, for reasons of scalability (i.e. the ability to grow the access network as more and more end users are connected) it is not desirable to have a central point, such as a head end, determining whether or not to allow end

users to join a multicast channel. Therefore, the present invention proposes that a vetting mechanism is distributed to the network access units of end users which vet requests by end users to join multicast channels with respect to a predetermined list of permitted multicast channels for the user and selectively forwards the request responsive to the vetting when the list comprises the requested multicast channel. Thus, only requests to join a multicast channel for users who are permitted to access the multicast signal are forwarded to the network head end, for example. Thus, the network head end can simply respond to all such requests by adding the end user to the multicast group address without having to determine whether or not the end user is allowed to access the multicast signal. Thus, scalability is improved.

The Examiner will appreciate that the prior art reference Lewis does not address this very specific problem and, as will be discussed in detail below, does not teach the solution as presently claimed. In particular, Lewis does not relate to the provision of multicast services nor to network access systems having a shared medium access architecture. Moreover, as will be discussed in detail below, Lewis does not teach the specific features of selectively forwarding a request to join a multicast channel in response to vetting when the user is permitted to access the multicast channel. In fact, Lewis teaches directly away from this feature as will be described below.

Claim Rejections

Turning to the claim rejections under 35 USC §§102 and 103(a), the applicants believe that the claim amendments address the Examiner's rejections by clarifying the novel and non-obvious features of the present invention over the prior art citations raised by the Examiner.

The Examiner rejects claims 1, 2 to 8, 10 and 11 under 35 USC §102(e) as being anticipated by Lewis et al (US 6,009,099).

Superficially, the system described in Lewis looks similar to that of the present invention. However, after careful study, the applicants believe that there are several significant differences. Firstly, applicants believe that the video telecommunications delivery network 10 of Lewis is not a shared medium access network as claimed in amended claims 1, 10 and 16 despite the Examiner's comment that excess network CRU 18 is shared by a plurality of optical network units CMUs 20. One skilled in the art would understand that the term "shared medium access network" denotes an access network in which a signal transmitted towards end users will be received by all end users on the shared medium network. In particular, one skilled in the art when reading the Background to the Invention section of the present application (page 1, lines 9 to 23) and when considering the problem addressed by the present invention (page 3, lines 8 to 13) would readily appreciate the meaning of this term.

Lewis does not teach a shared medium access network

In Lewis, however, the Examiner will see that neither the links between access network CRUs 18 and optical network unit CMUs 20, nor the links between optical network unit CMUs 20 and set top units 22 are shared medium access network links. Regarding the former, the passage at column 2, lines 44 to 55 clearly indicates that CMU 20 needs to send a request to CRU 18 if the requested video channel is not being received at CMU 20. Regarding the latter, each set top unit 22 has a pre-assigned virtual circuit identifier (VCI) and, when CMU 20 arranges for delivery of a video channel in response to a request from set top unit 22, it translates the VCI of the video channel received at CMU 20 to the VCI specified to set top unit 22 (see column 2, lines 24 to 25 and 40 to 43). Thus, each set top unit 22 is individually addressed by means of a pre-assigned VCI. Thus, video telecommunications delivery network 10 is not a shared medium access network within the meaning of the present invention.

Lewis does not teach multicast signals or channels

Furthermore, for the same reasons as discussed above in relation to each set top unit 22 being individually addressed by means of a pre-assigned VCI, it cannot be said that Lewis describes a network access unit or method for restricting user access to multicast signals nor to a network access unit or method in which requests from a user to join a multicast channel are received, vetted and selectively forwarded as required in amended claims 1, 10 and 16.

Lewis does not teach selectively forwarding request to join a multicast channel in response to vetting when the user is permitted to access the multicast channel

However, perhaps the most striking difference between the present invention as claimed and Lewis is that user requests to join a multicast channel are selectively forwarded in response to vetting the request with respect to a predetermined list of permitted multicast channels for a user when the requested multicast channel is comprised in the list. In Lewis, set top unit 22 sends a video channel request to CMU 20 (column 2, lines 26 to 28). CMU 20 receives and interprets the request from set top unit 22

"skipping over channels not currently authorized for channel up or down requests and initiating an authorization procedure for channels specifically requested but not currently authorized. If the requested channel is already being received at cell multiplexing unit 20, the program stream for the video channel is delivered on a VCI which is specified in the reply to the video channel request." (column 2, lines 29 to 30 and 32 to 40). (emphasis added)

It is not entirely clear to the applicants what "skipping over channels not currently authorized" means, but it is clear that CMU 20 does not forward the video channel request received from set top unit 22 when the set top unit 22 is authorized. Rather, the program stream for the video channel is simply delivered to the set top unit (provided it is already being received at CMU 20). Whereas, if the set top unit is not authorized, CMU 20 initiates an authorization procedure as further specified in

column 3, line 16 to column 4, line 2. Thus, Lewis in fact teaches away from the claimed invention in that the authorization procedure is initiated when the user is not permitted to access the video channel whereas no request is forwarded when the user is permitted.

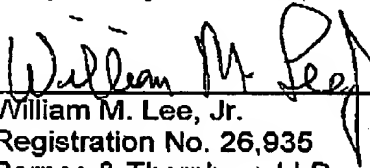
The Examiner further rejects claims 13, 16 and 17 under 35 USC §103(a) as being unpatentable over Lewis in view of Bhagavath et al (EP 994600). The rejection of claim 13 is moot in view of the arguments above. However, in respect of claims 16 and 17, and additionally in respect of claim 13, applicants deny that one skilled in the art would be motivated to combine these references for the following reasons. Firstly, there is no explicit suggestion in either reference that would lead one skilled in the art to make such a combination and, in this sense, the Examiner appears to be indulging in impermissible hindsight. Furthermore, applicants firmly believe that the teachings of Lewis and Bhagavath are technically incompatible. The Examiner will appreciate that Lewis specifically describes an ATM network whereas Bhagavath teaches the use of IGMP messages which are used in IP networks. Note that digital multicast bank 16 of Lewis is not a multicast router because the term "multicast router" is well understood in the art as referring to IP routers which are capable of handling multicast IP addresses. The Examiner will appreciate that the IGMP protocol which is an IP network protocol simply cannot be employed in an ATM network for reasons of technical incompatibility. Accordingly, the Examiner's rejections under 35 USC §103(a) are respectfully traversed.

The Examiner's rejections of the remaining dependent claims are moot in view of the above.

Accordingly, applicants believe that the amended claims are novel and non-obvious over the prior art citations raised by the Examiner and request favorable reconsideration.

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Respectfully submitted,



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